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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,353	12/14/2001	Kim B. Roberts	9-13528-153US	1147
20988	7590	07/13/2006	EXAMINER	
OGILVY RENAULT LLP 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A2Y3 CANADA			PAYNE, DAVID C	
			ART UNIT	PAPER NUMBER
			2613	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/014,353		ROBERTS ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	David C. Payne		2613	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 7,8,10-15 and 26-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7,8,10-12,14,26,27,31-39 and 42-48 is/are rejected.
- 7) ☒ Claim(s) 13,15,28-30,40,41 and 49 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 7,8, 10-15, and 26-49 have been considered but are moot in view of the new ground(s) of rejection.
2. Contrary to Applicant's remarks regarding "*In preparing the above-noted amendments, careful attention was paid to ensure that no new subject matter has been introduced*" Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Specifically, claims relating to the **key selector**, e.g. new claim 46, was not previously presented.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 7, 8, 10, 11, 12, 14, 26, 27, 31, 32, 33, 34, 35, 36, 37, 38, 39, 42, 43, 44, 45, 46, 47, and 48 rejected under 35 U.S.C. 102(e) as being anticipated by Kimmitt US 6618395 B1 (Kimmitt).

Re claim 7, 8, 10, 11, 12, 14, 26, 27, 31, 32, 33, 34, 35, 36, 37, 38, 42, 43, 44, and 45,

Kimmit disclosed,

In accordance with the present invention a physical coding sublayer is disclosed which facilitates communication across multiple serial channels in short haul copper links (such as backplanes and short cable connections) and wave division multiplexing (WDM) applications (employing fiber optic media). A system incorporating the presently disclosed physical coding sublayer is illustrated in FIG. 1. Referring to FIG. 1, data is received from a host system interface over a communication link 10 at a system interface 12. The system interface is coupled to media access control (MAC) circuitry 14 and provides the interface between the host system interface and the MAC 14. The MAC 14 controls the reception and transmission of data from and to the physical layer in accordance with techniques well known in the art. (e.g.

Col./lines: 3/40-60)

Each of the channels 34, 36, 38, 40 has a separate side scrambler 44,

which is generating the same binary sequence. The sequence generated in each channel, however, is offset in time, so that channels are de-correlated locally in time. In a preferred embodiment, decorrelation is achieved over  $\pm 2.9$  us, using a pseudo-random binary sequence (PRBS15 sequence), which serves to de-correlate Near End Crosstalk (NEXT) and Far End Crosstalk (FEXT) contributions from other channels. The time offset of the sequences in the respective channels is achieved by loading different seeds in each channel at startup. Separate side scramblers for each channel provide the benefit of keeping global interconnects low while providing a more scalable architecture. Alternatively, a centralized scrambler may be employed. (e.g. Col./lines: 10/20-30)

In the present embodiment, a pseudo random binary sequence of length 15 was chosen to allow receiver synchronization within one Idle transmission period. Data in each channel is defined to be constant at either 0x00 or 0xFF during an Idle transmission so the 15 bit seed can be recovered completely within a 16-bit word (e.g. Col./lines: 10/40-45)

Re claims 39, 46, 47, 48

The Skew/Control Encoder logic 50 rotates the respective K bits to

channels in which the R1 bits were not generated to provide a key which the receiver can use to detect and adjust for inter-channel skew. In the present implementation, the K<3:0> code bits are rotated by one bit across the four channels and attached to the data as the TX<17> bit in each channel, as shown in (e.g. Col./lines: 14/39-45)

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7, 8, 11, 26, 27, 31, 33, 34, 35, 38, 42, 43, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Du et al. US 6417958 B1 (Du).

Re claim 7, 8, 11, 26, 27, 31, 33, 34, 35, 38, 42, 43, 44, 45, 49 Du disclosed FIG. 4 illustrates an experimental setup 30 that can be used to evaluate

SPS crosstalk in accordance with the principles of the present invention. As will be discussed in detail below, problems with this setup in the past have resulted in incorrect conclusions regarding the workability of co-propagating fiber Raman amplifiers. Referring to FIG. 4, a total of N channels (for example, 100 GHz spaced WDM channels) are used to deplete a co-propagating

Raman pump. The depleting tones are modulated in a Mach-Zehnder modulator 32 at a frequency of 9.95 Gb/s, using a  $2^x - 1$  pseudo-random bit stream (PRBS) sequence, with  $x=7, 9$  or  $31$ . The bit patterns of the  $N$  depleting tones are made statistically independent (i.e., decorrelated) by time-shifting their bit patterns relative to each other, for example by using a pair of AWGR's connected with fiber delay lines having different lengths for the  $N$  individual wavelengths. A probe signal  $P$  is also modulated at 9.95 Gb/s, in a second Mach-Zehnder modulator 34, using a  $2^{23} - 1$  PRBS sequence. The two PRBS sequences are generated from individual pattern generators having independent clocks. The modulated probe signal is then combined with the statistically independent depleting tones, passed through an erbium-doped preamplifier 35 and launched into a fiber span 36 consisting of 80 km of fiber. Fiber span 36 is co-pumped with light from a semiconductor Raman pump source 38. In an exemplary experimental setup, the Raman pump power launched into fiber span 36 may be 270 mW, with the pump wavelength centered at 1435 nm, providing a peak Raman gain of approximately 13 dB in the 1525-1545 nm window. By adjusting the launch power of the  $N$  depleting tones (along with the probe signal) with an attenuator 40, the amount of Raman pump depletion can be varied between zero (with low launch power) and 15 dB. The pump depletion is measured by monitoring the pump throughput at the end of fiber span 36 with a power meter 37. Careful choice of the probe signal wavelength and power will minimize the amount of cross-phase modulation between the depleting tones and the probe

channel. The large number of depleting tones ensures that the launch power per tone is sufficiently low so as to avoid SBS in the transmission fiber. At the receiver, probe signal P is selected with a bandpass filter 42 and a section of dispersion compensating fiber (DCF) 44 is used to compensate for the dispersion accumulated through the 80 km of transmission fiber. By adjusting the input level to an erbium-doped preamplifier 46, it can be ensured that the OSNR at the output of preamplifier 46 is fixed at 21.4 dB, with 0.1 nm resolution bandwidth, for any level of Raman pump depletion. The output is then passed through an optical receiving element 48 (such as a PIN photodiode) to convert the received optical signal into an electrical equivalent. The penalties caused by SPS crosstalk between the depleting tones and the probe are then quantified by the "Q" of the probe channel by measuring the bit error rate (BER) versus receiver decision level threshold, in an error measurement arrangement. For example col. 7/ lines 5-60.

Du does not disclose a decoder at the received side but it would have been obvious to one of ordinary skill in the art at the time of invention that received side would need decoders to interpret the pseudo-random data.

***Allowable Subject Matter***



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5. Claims 13, 15, 28, 29, 30, 40, 41 and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: **Hansen et al. US 6323993 B1 (Hansen), Gnauck et al. US 6856768 B2 (Gnauck), Huang et al. US 6614950 B2 (Huang).**
7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

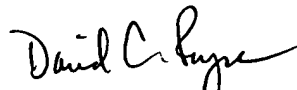
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (571) 272-3024. The examiner can normally be reached on M-F, 7:00a - 4:30p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dcp

  
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Primary Examiner  
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